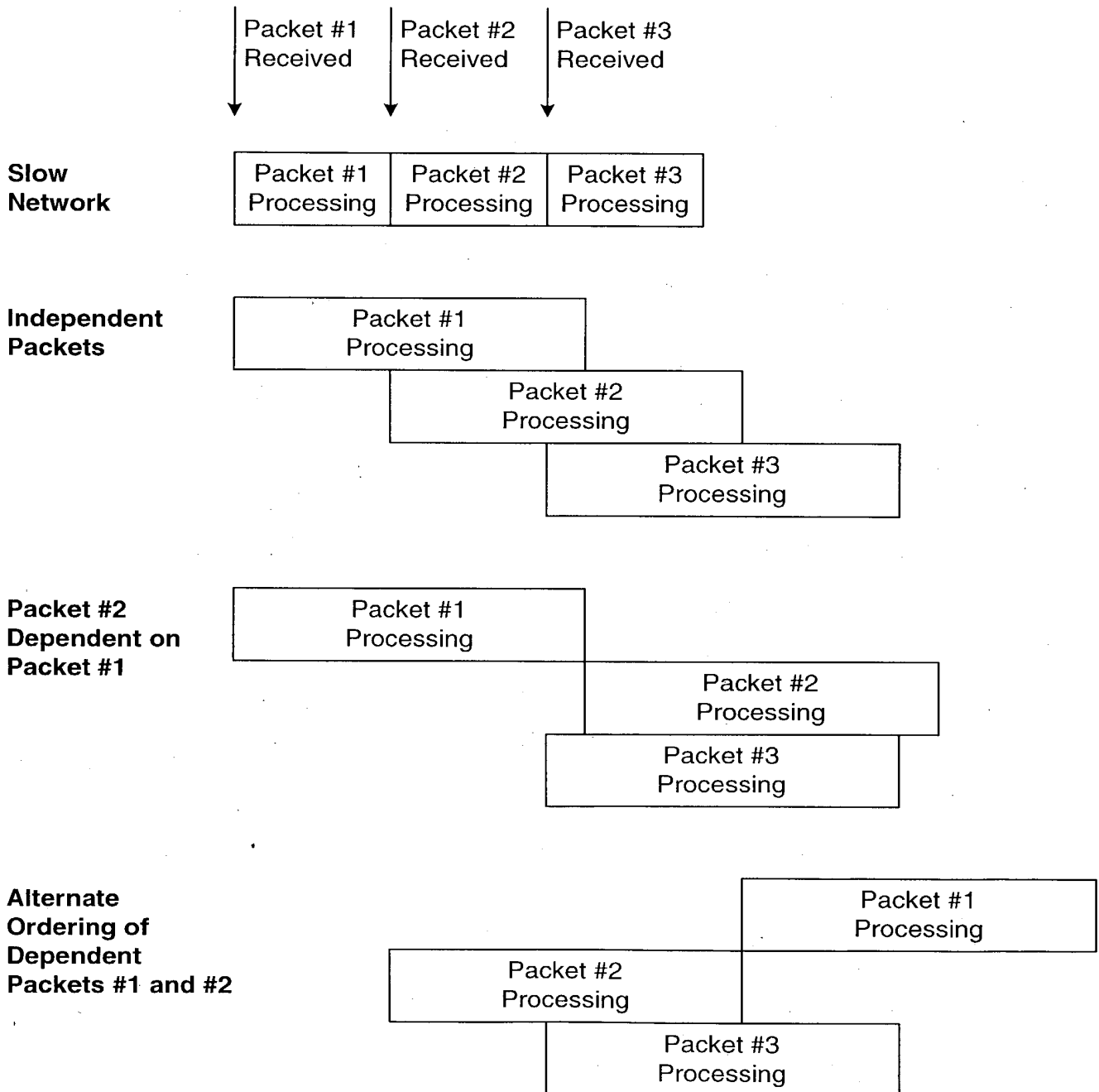
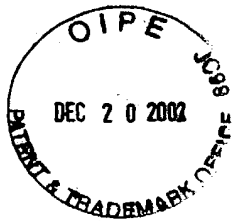




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**Figure 1**  
General Packet Processing Examples

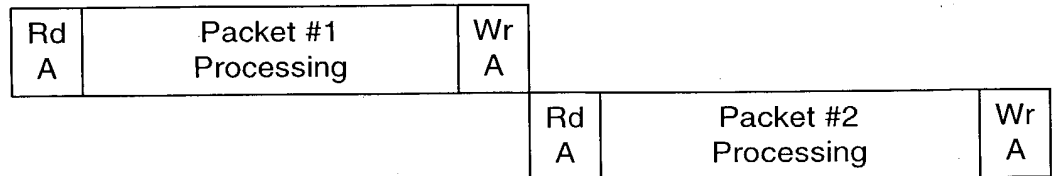




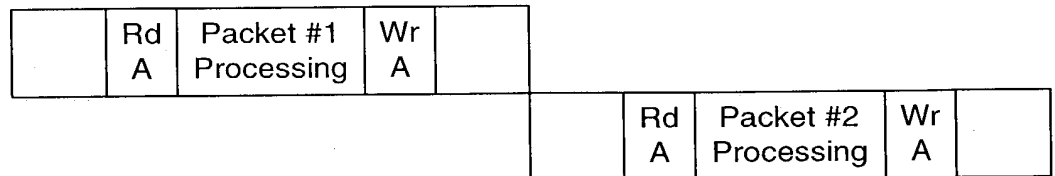
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**Figure 2**  
Optimal Overlap of Dependent Packets

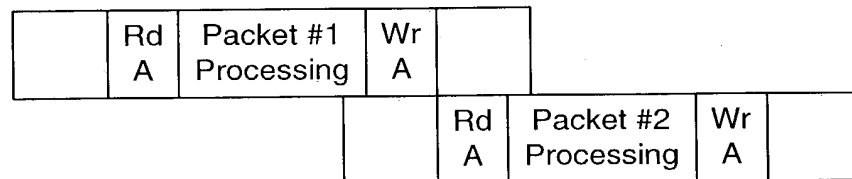
**No Overlap Possible**



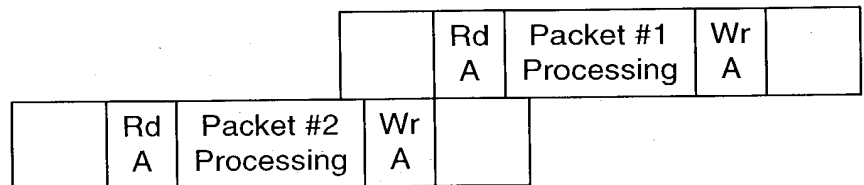
**Non-Optimal Overlap**



**Optimal Overlap**



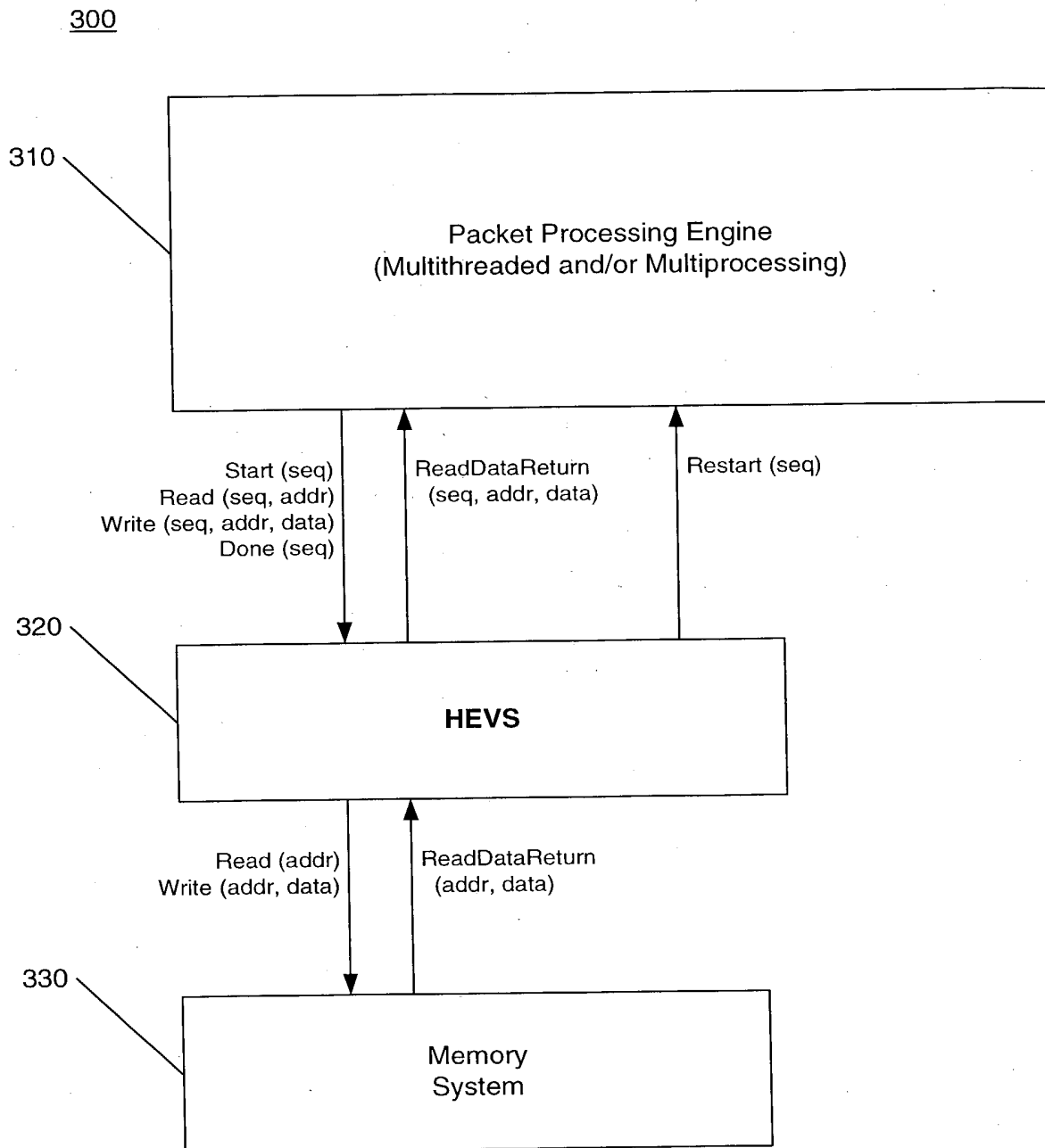
**Alternate Ordering Optimal Overlap**





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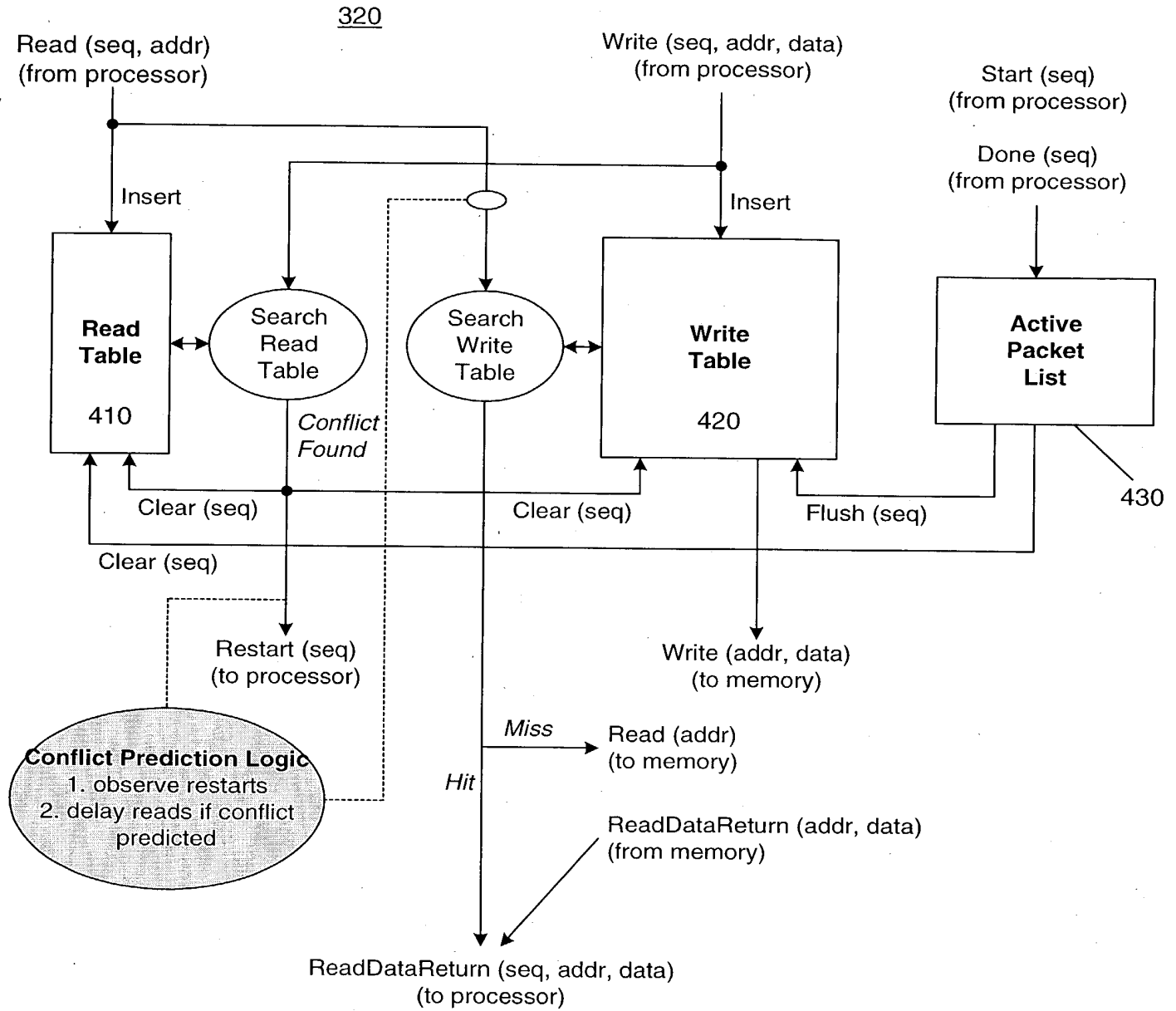
**Figure 3**  
Hardware Enforced Virtual Sequentiality Block Diagram





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**Figure 4**  
Hardware Enforced Virtual Sequentiality Mechanism





010303 050505 010303 010303

**Figure 5**  
Read Table and Write Table Detail

**Read Table**

|           | Seq. | Addr. |
|-----------|------|-------|
|           |      |       |
| <b>p:</b> | 1    | A     |
| <b>q:</b> | 2    | B     |
|           |      |       |
| <b>s:</b> | 3    | B     |
| <b>t:</b> | 2    | A     |
|           |      |       |

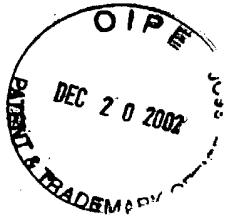
**Write Table**

|           | Seq. | Addr. | Data | Depend |
|-----------|------|-------|------|--------|
|           |      |       |      |        |
| <b>r:</b> | 2    | B     | X    | 3      |
|           |      |       |      |        |
| <b>u:</b> | 1    | A     | X    | (null) |
|           |      |       |      |        |

Diagram illustrating the Read Table and Write Table for a memory access sequence. The Read Table shows the sequence of reads (Seq.) and their corresponding addresses (Addr.). The Write Table shows the sequence of writes (Seq.), their corresponding addresses (Addr.), the data written (Data), and the dependency (Depend).

Time Sequence:

1. Packet #1 reads location A  
Entry **p**: created in Read Table  
Write Table is searched, no matches found so memory read is performed
2. Packet #2 reads location B  
Entry **q**: created in Read Table  
Write Table is searched, no matches found so memory read is performed
3. Packet #2 writes location B  
Entry **r**: created in Write Table  
Read Table is searched, no conflicts found
4. Packet #3 reads location B  
Entry **s**: created in Read Table  
Write Table is searched, entry r: found, data X forwarded and dependency list updated
5. Packet #2 reads location A  
Entry **t**: created in Read Table  
Write Table is searched, no matches found so memory read is performed
6. Packet #1 writes location A  
Entry **u**: created in Write Table  
Read Table is searched for newer sequence read, entry **t**: is found  
Conflict is signaled to processor, Packet #2 is restarted  
Entry **q**: and all other sequence 2 entries are deleted  
Deletion of entry **r**: triggers Packet #3 restart signaled



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**Figure 6**  
Conflict Detection Processing Examples

